

IN THE CLAIMS

Please amend the claims as follows:

WHAT IS CLAIMED IS:

Claims 1-7 (Canceled).

Claim 8 (original) A radiation detecting system comprising:

a scintillator for converting an X-ray incident from a surface side into light;

at least one photodiode chip having a plurality of photodiodes for converting the converted light into electrical signals;

at least one switching chip having a plurality of switching elements for reading out a plurality of signals from said plurality of photodiodes;

at least one data acquisition chip having a plurality of data acquisition systems for amplifying the plurality of readout signals and converting the signals into digital signals; and

a rigid printed wiring board on which said photodiode chip, said switching chip, and said data acquisition chip are commonly mounted.

Claim 9 (original) A detecting system according to claim 8, wherein

said photodiode chip is bump-connected to said rigid printed wiring board through a plurality of via interconnections which are connected to said plurality of photodiodes and extend through a semiconductor substrate from an upper surface to a lower surface,

said switching chip is connected to said rigid printed wiring board by flip chip bonding, and

said data acquisition chip is connected to said rigid printed wiring board by flip chip bonding.

Claim 10 (original) A radiation detecting system comprising: ~

a scintillator for converting an X-ray incident from a surface side into light;

at least one photodiode chip having a plurality of photodiodes for converting the converted light into electrical signals;

at least one switching chip having a plurality of switching elements for reading out a plurality of signals from said plurality of photodiodes;

at least one data acquisition chip having a plurality of data acquisition systems for amplifying the plurality of readout signals and converting the signals into digital signals; and

a rigid multilayer wiring board on which said photodiode chip, said switching chip, and said data acquisition chip are commonly mounted.

Claim 11 (original) A detecting system according to claim 10, wherein

said photodiode chip is bump-connected to an upper surface of said multilayer wiring board through a plurality of via interconnections which are connected to said plurality of photodiodes and extend through a semiconductor substrate from an upper surface to a lower surface,

said switching chip is connected to the upper surface of said rigid multilayer wiring board by flip chip bonding, and

said data acquisition chip is connected to a lower surface of said rigid multilayer wiring board by flip chip bonding.

Claim 12 (original) A detecting system according to claim 10, wherein

said photodiode chip is bump-connected to an upper surface of said multilayer wiring board through a plurality of via interconnections which are connected to said plurality of photodiodes and extend through a semiconductor substrate from an upper surface to a lower surface,

said switching chip is connected to a lower surface of said rigid multilayer wiring board by flip chip bonding, and

said data acquisition chip is connected to the lower surface of said rigid multilayer wiring board by flip chip bonding.

Claim 13 (original) A detecting system according to claim 10, wherein a rear surface of said switching chip is bonded to the upper surface of said multilayer wiring board, a rear surface of said photodiode chip is bonded to an upper surface of said switching chip, and said data acquisition chip is bonded to the lower surface of said multilayer wiring board.

Claim 14 (original) A detecting system according to claim 13, wherein  
the plurality of photodiodes are connected to the plurality of switching elements through a plurality of first via interconnections extending through the photodiode substrate from an upper surface to a lower surface,

the plurality of switching elements are connected to a plurality of upper surface interconnections on said multilayer wiring board through a plurality of second via interconnections extending through a switching element board from an upper surface to a lower surface, and

said data acquisition chip is connected a plurality of lower surface interconnections of said multilayer wiring board by flip chip bonding.

Claim 15 (original) A detecting system according to claim 13, wherein said data acquisition chip is placed on a peripheral portion of said multilayer wiring board.

Claim 16 (original) A detecting system according to claim 15, further comprising a plurality of X-ray shield plates placed above said data acquisition chip.

Claim 17 (original) A radiation detecting system comprising:  
a scintillator for converting an X-ray incident from a surface side into light;  
at least one photodiode chip having a plurality of photodiodes for converting the converted light into electrical signals;

at least one switching chip having a plurality of switching elements for reading out a plurality of signals from said plurality of photodiodes;

at least one data acquisition chip having a plurality of data acquisition systems for amplifying the plurality of readout signals and converting the signals into digital signals;

a first rigid printed wiring board on which said photodiode chip and said switching chip are mounted;

a second rigid printed wiring board on which said data acquisition chip is mounted;  
and

a connector for detachably connecting said first rigid printed wiring board to said second rigid printed wiring board.

Claim 18 (original) A system according to claim 17, wherein said photodiode chip is bump-connected to upper surface interconnections of said first rigid printed wiring board through a plurality of via interconnections which are connected to said plurality of photodiodes and extend through a semiconductor substrate from an upper surface to a lower surface.

Claim 19 (Canceled).

Claim 20 (original) An X-ray CT apparatus comprising:

an X-ray source which emits X-rays while rotating around an object to be examined;  
a radiation detection system having a plurality of detection elements for detecting X-rays passing through the object, which are arranged in row and column directions; and

reconstruction means for reconstructing a CT image of the object on the basis of the projection data,

wherein said radiation detection system includes

a scintillator for converting an X-ray incident from a surface side into light,

at least one photodiode chip having a plurality of photodiodes for converting the converted light into electrical signals,

at least one switching chip having a plurality of switching elements for reading out a plurality of signals from said plurality of photodiodes,

at least one data acquisition chip having a plurality of data acquisition systems for amplifying the plurality of readout signals and converting the signals into digital signals, and

a rigid printed wiring board on which said photodiode chip, said switching chip, and said data acquisition chip are commonly mounted.

Claim 21 (original) An X-ray CT apparatus comprising: {

an X-ray source which emits X-rays while rotating around an object to be examined;

a radiation detection system having a plurality of detection elements for detecting X-rays passing through the object, which are arranged in row and column directions; and

reconstruction means for reconstructing a CT image of the object on the basis of the projection data, wherein said radiation detection system includes a scintillator for converting an X-ray incident from a surface side into light,

at least one photodiode chip having a plurality of photodiodes for converting the converted light into electrical signals,

at least one switching chip having a plurality of switching elements for reading out a plurality of signals from said plurality of photodiodes,

at least one data acquisition chip having a plurality of data acquisition systems for amplifying the plurality of readout signals and converting the signals into digital signals, and

a rigid multilayer printed wiring board on which said photodiode chip, said switching chip, and said data acquisition chip are commonly mounted.

Claim 22 (original) An X-ray CT apparatus comprising: {

an X-ray source which emits X-rays while rotating around an object to be examined;

a radiation detection system having a plurality of detection elements for detecting X-rays passing through the object, which are arranged in row and column directions; and reconstruction means for reconstructing a CT image of the object on the basis of the projection data,

wherein said radiation detection system includes  
a scintillator for converting an X-ray incident from a surface side into light,  
at least one photodiode chip having a plurality of photodiodes for converting the converted light into electrical signals,  
at least one switching chip having a plurality of switching elements for reading out a plurality of signals from said plurality of photodiodes,  
at least one data acquisition chip having a plurality of data acquisition systems for amplifying the plurality of readout signals and converting the signals into digital signals,  
a first rigid printed wiring board on which said photodiode chip and said switching chip are mounted;  
a second rigid printed wiring board on which said data acquisition chip is mounted,  
and

a connector for detachably connecting said first rigid printed wiring board to said second rigid printed wiring board.

Claim 23 (original) A radiation detection system comprising:     ^  
a detection element group constituted by a plurality of detection elements for detecting X-rays;  
data acquisition means for acquiring output data from said detection element group;  
a substrate on which at least one of said detection element group and said data acquisition means is mounted; and

means for forming said detection element group, said data acquisition means, and said substrate into a multilayer structure.

Claim 24 (original) A radiation detection system comprising:

a scintillator block for converting X-rays into light; ¶

a photodiode array for converting the light into electrical signals;

a switch for selecting a photodiode, from said photodiode array, from which an electrical signal is to be output;

a data acquisition chip for acquiring data output from said photodiode array selected by said switch; and

means for integrating said scintillator block, said photodiode array, said switch, and said data acquisition chip.

Claim 25 (original) An X-ray CT apparatus comprising: ¶

an X-ray source which emits X-rays while rotating around an object to be examined;

a radiation detector having a plurality of detection elements for detecting X-rays passing through the object, which are arranged in row and column directions;

data acquisition means for acquiring projection data associated with the object by using an output from said radiation detector;

switch means for selecting data from the plurality of detection elements which are to be output to said data acquisition means;

reconstruction means for reconstructing a CT image of the object on the basis of the projection data; and

means for forming said radiation detector and at least one of said data acquisition means and said switch into a multilayer structure.

Claim 26 (original) A radiation detection system comprising: ¶

a detection element group constituted by a plurality of detection elements for detecting X-rays;

a first substrate on which said detection element group is mounted;

a data acquisition chip for acquiring output data from said detection element group;

a second substrate on which said data acquisition chip is mounted; and

connection means for connecting said first and second substrates in a one-to-one correspondence.

Claim 27 (original) A system according to claim 26, wherein said connection means comprises a connector for electrically connecting said first and second substrates.

Claim 28 (original) A system according to claim 27, wherein

said first substrate has said detection element group mounted on an X-ray incident surface side,

said second substrate has said data acquisition chip mounted on the other surface side with respect to the X-ray incident surface, and

said connection means connects through the connector a surface of said first substrate on which said detection element group is not mounted to a surface of said second substrate on which said data acquisition chip is not mounted.

Claim 29 (original) A system according to claim 26, wherein said second substrate has said data acquisition chip mounted in an X-ray transmission area, and has the connector mounted outside the X-ray transmission area.

Claim 30 (original) An X-ray CT apparatus comprising:

an X-ray source which emits X-rays while rotating around an object to be examined;

a radiation detector having a plurality of detection elements for detecting X-rays passing through the object, which are arranged in row and column directions;



data acquisition means for acquiring projection data associated with the object by using an output from said radiation detector;

reconstruction means for reconstructing a CT image of the object on the basis of the projection data; and

connection means for connecting in a one-one-one correspondence a first substrate on which said X-ray detector is mounted to a second substrate on which said data acquisition means is mounted.

Claims 31 - 35 (Canceled).